

3.17 Graphs of Polar Equations

Name _____ Date _____ Period _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Draw a graph of the rose curve.

1) $r = 2 \sin 3\theta, 0 \leq \theta \leq 2\pi$

1) _____

2) $r = 4 \cos 2\theta, 0 \leq \theta \leq 2\pi$

2) _____

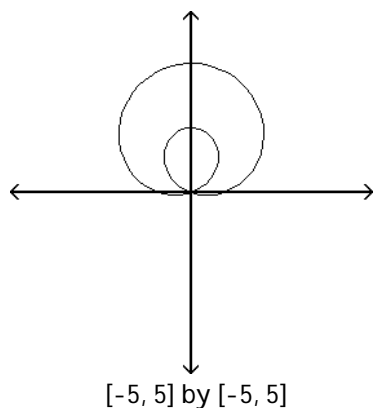
3) $r = -3 \sin 5\theta, 0 \leq \theta \leq 2\pi$

3) _____

MATCHING. Choose the item in column 2 that best matches each item in column 1.

The graph of a limaçon curve is given. Without using your graphing calculator, determine which equation is correct for the graph.

4)



A) $r = 1 + 3 \sin \theta$

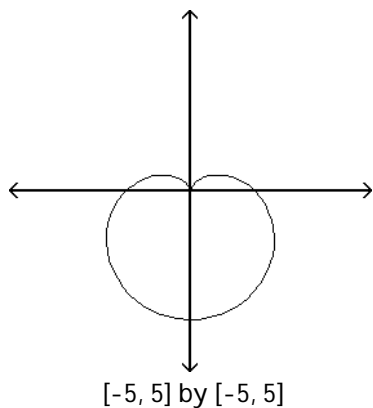
4) _____

B) $r = 1 + 3 \cos \theta$

C) $r = 3 + \sin \theta$

D) $r = 2 + 2 \sin \theta$

5)



A) $r = 2 - 2 \sin \theta$

5) _____

B) $r = 2 + 2 \sin \theta$

C) $r = 3 - 2 \sin \theta$

D) $r = 1 - 3 \sin \theta$

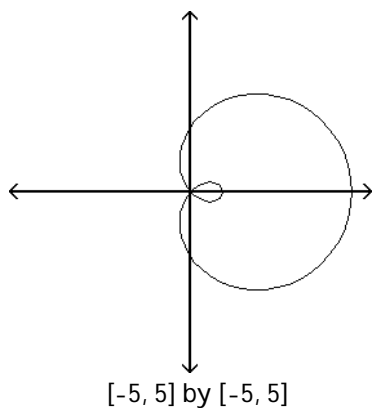
E) $r = 4 + \cos \theta$

F) $r = 2 + 2 \cos \theta$

G) $r = 2 + 3 \cos \theta$

6) _____

6)



H) $r = 3 + 2 \cos \theta$

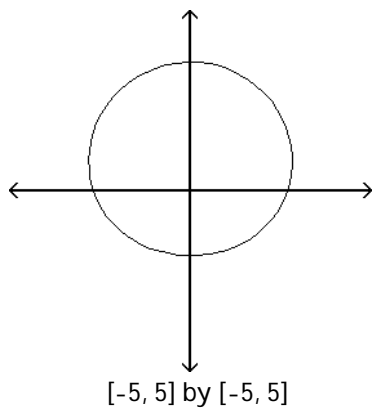
I) $r = 3 + 2 \sin \theta$

J) $r = 3 + \sin \theta$

K) $r = 1 + 3 \sin \theta$

7)

7) _____



SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

- 8) For what values of θ ($0 \leq \theta < 2\pi$) do maximum r -values occur on the graph of the polar equation $r = 2 \sin 4\theta$? Note that a maximum r -value occurs at a point that is the maximum distance from the pole.

8) _____

9) For what values of θ ($0 \leq \theta < 2\pi$) do maximum r -values occur on the graph of the polar equation $r = 2 \cos 4\theta$? Note that a maximum r -value occurs at a point that is the maximum distance from the pole. 9) _____

10) For what values of θ ($0 \leq \theta < 2\pi$) do maximum r -values occur on the graph of the polar equation $r = 2 + 4 \sin \theta$? Note that a maximum r -value occurs at a point that is the maximum distance from the pole. 10) _____

11) For what values of θ ($0 \leq \theta < 2\pi$) do maximum r -values occur on the graph of the polar equation $r = -2 + 5 \cos \theta$? Note that a maximum r -value occurs at a point that is the maximum distance from the pole. 11) _____

Analyze the graph of the given polar curve. Include the following information: If possible, describe the shape of the graph (circle, rose curve, limacon, etc.), and state the domain, range, and maximum r -value of the graph.

12) $r = 3$ 12) _____

13) $\theta = \pi/3$ 13) _____

14) $r = 2 \sin 3\theta$ 14) _____

15) $r = 5 + 4 \sin \theta$ 15) _____

16) $r = 4 + 4 \cos \theta$

16) _____

17) $r = 5 + 2 \cos \theta$

17) _____

18) $r = 2 + 5 \cos \theta$

18) _____

19) $r = 1 - \cos \theta$

19) _____

20) $r = 2\theta$

20) _____

21) $r^2 = \sin 2\theta, 0 \leq \theta \leq 2\pi$

21) _____